

WHAT IS CLAIMED IS:

1           1.     A method for producing porous Group III-V material, the  
2 method comprising steps of:

3                 depositing a thin discontinuous layer of metal on a Group III-V  
4 material surface;

5                 etching the Group III-V material surface in a HF and oxidant  
6 solution, said etching being conducted without external electrical bias.

1           2.     The method according to claim 1, wherein said step of  
2 etching is conducted in the absence of illumination.

1           3.     The method according to claim 1, wherein said step of  
2 etching is conducted in the presence of illumination.

1           4.     The method according to claim 1, wherein said metal  
2 comprises Pt.

1           5.     The method according to claim 1, wherein said metal  
2 comprises Au.

1           6.     The method according to claim 1, wherein said metal  
2 comprises Pd.

1           7.     The method according to claim 1, wherein said metal  
2 comprises a combination of metals selected from the group of Au, Pt and Pd.

1           8.     The method according to claim 1, wherein said oxidant  
2 comprises H<sub>2</sub>O<sub>2</sub>.

1           9.     The method according to claim 1, wherein the thickness of  
2 said metal is less than approximately 10nm.

1           10.    The method according to claim 1, wherein said etching is  
2 conducted for a time period between about 2 seconds and one hour.

1           11.    The method according to claim 1, wherein said Group III-V  
2 material comprises GaN.

1           12. A method for producing porous Group III-V material, the  
2 method consisting of the following steps:

3           depositing a thin discontinuous layer of metal on a Group III-V  
4 material surface;

5           etching the Group III-V material surface in a HF and oxidant  
6 solution for a period of about two seconds up to 60 minutes.

1           13. The method according to claim 12, wherein said step of  
2 etching is conducted in the absence of illumination.

1           14. The method according to claim 12, wherein said step of  
2 etching is conducted in the presence of illumination.

1           15. The method according to claim 12, wherein said metal  
2 comprises Pt.

1           16. The method according to claim 12, wherein said metal  
2 comprises Au.

1           17. The method according to claim 12, wherein said metal  
2 comprises Pd.

1           18. The method according to claim 12, wherein said metal  
2 comprises a combination of metals selected from the group of Au, Pt and Pd.

1           19. The method according to claim 12, wherein said oxidant  
2 comprises H<sub>2</sub>O<sub>2</sub>.

1           20. The method according to claim 12, wherein the thickness of  
2 said metal is less than approximately 10nm.

1           21. The method according to claim 12, wherein said etching is  
2 conducted for a time period between about 2 seconds and one hour.

1           22. The method according to claim 12, wherein said Group III-V  
2 material comprises GaN.

1           23. A method for producing porous Group III-V material, the  
2 method comprising steps of:

3                depositing metal on a Group III-V material surface in a thickness  
4   sufficient to permit nucleation that forms nanometer size metal particles and small  
5   enough to prevent formation of a continuous metal layer;  
6                etching the Group III-V material surface in a HF and oxidant  
7   solution for a period of about two seconds up to 60 minutes, said etching being  
8   conducted without external electrical bias.